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We claim:

1. An apparatus for providing feedback to a user of a weight stack machine having weights for lifting and a frame, comprising:  
weight sensing means for determining the number of weights lifted;  
encoder means for detecting the distance moved by said weights during a lift;  
electronic detection means operatively coupled to said weight sensing means and said encoder means for computing data describing weights lifted; and  
interface means for transmitting said data from said electronic detection means to a storage means.
2. The apparatus of claim 1 wherein said storage means is a display.
3. The apparatus of claim 1 wherein said storage means is a mass storage device.
4. The apparatus of claim 1 wherein said storage means is an electronically programmable memory.
5. The apparatus of claim 1 wherein said encoder means comprises a retractable cable assembly having a first and a second end, said first end anchored to said frame and said second end adapted for

attachment to one of said weights.

6. The apparatus of claim 5 wherein said second end is attached to a pin used in said stack machine determinative of the number of weights for lifting.

7. The apparatus of claim 5 wherein said encoder means further comprises a rotary pulse generator coupled to said cable assembly having a pulse output, said pulse output representative of a distance traveled by said retractable cable.

8. The apparatus of claim 5 wherein said encoder means is a multi-turn potentiometer.

9. The apparatus of claim 1 wherein said weight sensor means comprises a plurality of proximity sensors.

10. The apparatus of claim 9 wherein said proximity sensors are photo sensitive.

11. The apparatus of claim 9 wherein said proximity sensors are inductive sensors.

12. The apparatus of claim 9 wherein said proximity sensors are magnetically activated.

13. The apparatus of claim 9 wherein said proximity sensors comprise a light curtain.

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14. An apparatus for providing feedback to a user of a weight stack machine having weights for lifting and a frame, comprising:  
one or more load cells;

electronic detection means operatively coupled to said weight sensing means and said encoder means for computing data describing weights lifted; and

interface means for transmitting said data from said electronic detection means to a storage means.

15. A method for providing feedback to a user of a weight stack machine having weights for lifting, comprising the steps of:

determining the number of weights lifted;

detecting the distance and speed of said weights during a lift;

computing data describing the number of weights lifted;

transmitting said data from said electronic detection means to a storage means.

16. A method as described in claim 15 further comprising receiving information from a storage means.

17. A method as described in claim 15 further comprising displaying said data on a display.

18. An apparatus for providing feedback to a user of weight stack machines having weights for lifting, comprising:

weight sensing means for determining the number of weights lifted;

encoder means for detecting the distance moved by said weights during a lift;

electronic detection means operatively coupled to said weight sensing means and said encoder means for computing data describing the weights lifted;

interface means for transmitting said data from said electronic detection means to a central storage means; and

reporting means operatively connected to said central storage means for generating reports from said data.

19. The apparatus of claim 18 wherein said interface means receives data from said central storage means.

20. The apparatus of claim 18 wherein said data from said storage means contains programming steps to be executed by said interface.

21. The apparatus of claim 18 wherein said data from said storage means contains historical data associated with a user of said apparatus.

22. The apparatus of claim 21 wherein said data is displayed on a display.

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